

Managing Manure Deposition By Grazing

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attributed these profound gradients in nutrient levels to higher rates of manure and urine deposition closer to the watering locations. The Missouri researchers also noted a greater gradient toward water in paddocks that were long and narrow. This could be because of the length:width ratio itself or to the distance cattle were required to travel to reach water.

The concern with this gradient of nutrients toward water is

two-fold. First, an environmental problem can develop at watering sites. Second, the nutrients building up at the watering site are being pulled from the bulk of the pasture area. Thus, the majority of the pasture becomes depleted of these nutrients.

Pasture systems requiring that animals travel a lane to access water results in a loss of excretal nutrients off of pasture. At the experimental scale, losses have averaged about 15 percent

and as high as 25 percent during the hottest part of the summer. At a commercial scale, manure loss off of pasture areas is likely at least this large, if not larger. The significance of this is that lanes that access water often do not provide much if any forage. Thus, the manure dropped in the lane not only represents a loss of nutrients off of pasture, but also a potential environmental problem.

Shade is a primary location for livestock camping and loaf-

ing, especially during hot, sunny days. However, cattle are often observed to camp under shade trees even during cloudy and/or cool days. Time spent camping under shade results in accumulation of manure and urine, and thus P and K, at the shade source. Missouri researchers found that the gradient of P and K concentration toward a single shade tree increased more sharply and to a greater extent than that toward the watering site (Figure 1).

Endophyte-infected fescue plays a role here, too. The gradient toward shade trees is even worse on endophyte-infected fescue pasture since cattle are more attracted to shade when stressed.

The need for shade on pasture for optimization of livestock comfort and performance is a somewhat controversial subject. In Pennsylvania, there are probably several days during the summer when beef cattle "need" shade, and several weeks when dairy cattle "need" shade. Thus, it is probably a good plan to have shade available in a few paddocks. However, for most of the paddocks on the farm, unless shade is movable or fairly uniformly distributed throughout the paddock, it is probably best not to intentionally provide shade. In fact, consider removing/or fencing off shade trees in most paddocks in order to negate the

powerful influence they have on animal behavior and thus the uniformity of excretal return.

Topography also influences patterns of excretal return. Both sheep and cattle tend to prefer the highest ground available to them to camp, especially during wet or warm weather. The tendency for higher ground to be drier and have greater exposure to cooling breezes is probably the reason for this. Research has documented greater manure deposition by both sheep and cattle on higher ground within paddocks.

How can a grazer improve the uniformity of manure deposition and thus take advantage of manure's tremendous fertilizer value?

Rotational stocking is an effective tool to improve the uniformity of distribution of livestock excreta. Research in New Zealand, the U.K. and the U.S. has documented that increased stocking densities improve uniformity of excretal return by both cattle and sheep.

Stocking density is the number of animals present per unit land area at a given point in time. Since rotational stocking involves the subdivision of larger land areas into smaller subunits, stocking densities are inherently increased. Also, rotational stocking "forces" animals to spend roughly equal amounts of time on the entire pasture system area by eliminating their ability to maintain permanent camping and loafing sites.

In one experiment with sheep in Australia, rotational stocking reduced the percentage of manure deposition on one percent of the pasture area of 24 percent to six percent. A decrease from 46 percent to 32 percent was observed on 10 percent of the area.

PILES PER 500 FT²

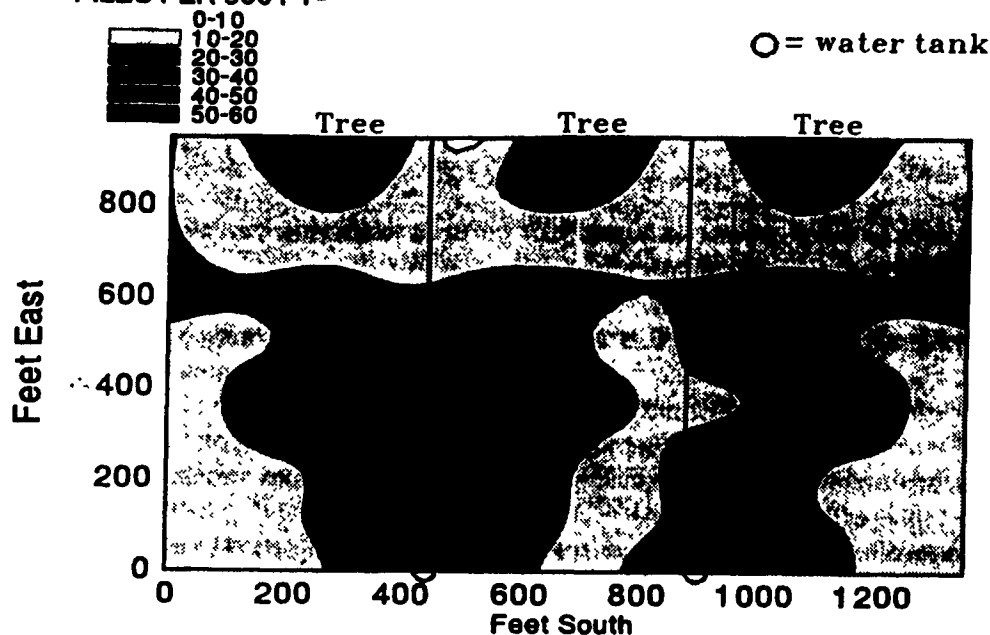


Figure 1. Cumulative manure distribution for a simulated 3-paddock grazing system in 1993-94.

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PROPERTY: being all that land as described as Parcels #104 and #86 on Maryland State Department of Assessments and Taxation Map Series #50, containing 93 acres more or less, in the aggregate. The property is primarily level with steep slopes on the James Run frontage. It is mostly cleared, tillable land and borders the Stoney Forest Demonstration Conservation Area. The existing dwelling is sold in "as is" condition.

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